

Memorandum

Date : May 8, 1996

To : Steve Yaeger, Program Deputy Director
CALFED Bay-Delta Program

George W. Barnes, Jr., Chief
Modeling Support Branch

From : Department of Water Resources

Subject: DWRSIM Studies of Large Scale Demand Reductions

This memo describes DWRSIM studies that were conducted in response to your April 16, 1996 request. The three studies, which employ Version 7.55 and assume State Water Resources Control Board December 15, 1994 Bay-Delta Plan standards, are summarized as follows:

- 2020c9b-CALFED-461. The purpose of this study is to evaluate State Water Project operations at a reduced 2020 demand level of 2.6 MAF/yr, including losses. All other assumptions are the same as in the DWRSIM study 2020c9a-SWRCB+SDI-414B.f (which assumes a 4.17 MAF/yr demand level).
- 2020c9b-CALFED-462. This study is identical to Study 461 except that SWP 2020 demand level is reduced to 3.2 MAF/yr, including losses.
- 2020c9b-CALFED-463. This study is identical to Study 461 except that SWP 2020 demand level is reduced to 3.7 MAF/yr, including losses.

Results from Studies 461, 462, 463 and base Study 414B are summarized in Table 1. Incremental impacts relative to the base study are also provided in Table 1. Frequency plots of annual SWP deliveries and end-of-September storage in Lake Oroville are shown in Figures 1 and 2, respectively.

Figure 1 shows that the probability of full SWP delivery increases as demand level decreases. Frequency of full delivery over the 71-year simulation (1922-92) is 34% at the base 4.17 MAF/yr demand level, 52% at the 3.7 MAF/yr demand level, 70% at the 3.2 MAF/yr demand level and 85% at the 2.6 MAF/yr demand level.

Deliveries during the critical period (May 1928 - October 1934) also increase as demand levels decrease. However, delivery increases are insignificant when compared with the overall delivery levels. Table 1 shows a 5 TAF/yr delivery increase (above the base study) at the 3.7 MAF/yr demand level, an 11 TAF/yr delivery increase at the 3.2 MAF/yr demand level, and a 27 TAF/yr delivery increase at the 2.6 MAF/yr demand levels.

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Over the 71-year simulation, on average, lower demand levels result in lower annual average SWP deliveries. These lower deliveries translate into higher Oroville Reservoir storage (see Figure 2) and larger surplus Delta outflows relative to the base study. Table 1 shows increases in long-term annual average storage and surplus flows of 119 TAF/yr and 190 TAF/yr, respectively, at the 3.7 MAF/yr demand level. Storage and surplus flows increase by 352 TAF/yr and 494 TAF/yr, respectively, at the 3.2 MAF/yr demand level. Finally, storage and surplus flows increase by 635 TAF/yr and 937 TAF/yr, respectively, at the 2.6 MAF/yr demand level.

If you or your staff have questions or need additional study results, please contact Paul Hutton at 653-5666.

Attachments

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